

HP retains #1 and #2 positions for two-processor performance on the SAP® SD Standard Application Benchmark with the ProLiant BL460c server blade AND ProLiant DL380 G5



The HP Difference

With features equal to standard 1U rack mount servers, the ProLiant BL460c server blade combines power-efficient compute power and high density with expanded memory and I/O.

The newest Quad-Core Intel Xeon version of the HP ProLiant DL380 G5 model is designed for improved server responsiveness, enhanced multi-tasking capabilities, and improved performance for the most demanding applications and virtualization projects.

The servers use the latest Intel x5460 45 nm Quad-Core technology.

Key results at a glance:

- Continued ProLiant leadership with the #1 and #2 two-processor, overall performance results on the two-tier SAP® Sales and Distribution (SD) Standard Application Benchmark.
- The ProLiant BL460c server blade supports up to 48.2% more users than other two-processor blade competitors.
- The ProLiant DL380 G5 beat the Dell PowerEdge 2950 by more than 50%.
- The results also eclipsed IBM's p 570 Power6 Dual-Core server result by 20.3% more users.
- The benchmark results show a 17.7% increase in performance for the ProLiant BL460c compared to its previous Quad-Core benchmark result and an increase of up to 17.0% for the ProLiant DL380 G5 when compared to its previous Quad-Core benchmark results.
- The performance results display how the HP BladeSystem two-processor server blades optimize the latest Quad-Core Intel® Xeon® technology utilizing the x5460 series processors.

Once again, HP ProLiant 2P Quad-Core servers, the BL460c server blade and the DL380 G5, achieved the #1 and #2 leading performance on the two-tier SAP SD Standard Application Benchmark with two-processor performances of 2,449 and 2,436 SAP SD Benchmark users, respectively.

HP 2P, Quad-Core ProLiant BL460c and DL380 G5 servers take the lead



ProLiant BL460c server blade



ProLiant DL380 G5

More information about SAP benchmark results for all servers can be found at the following Web page: <http://www.sap.com/benchmark>.

HP vs. two-processor Quad-Core and Dual-Core competitors

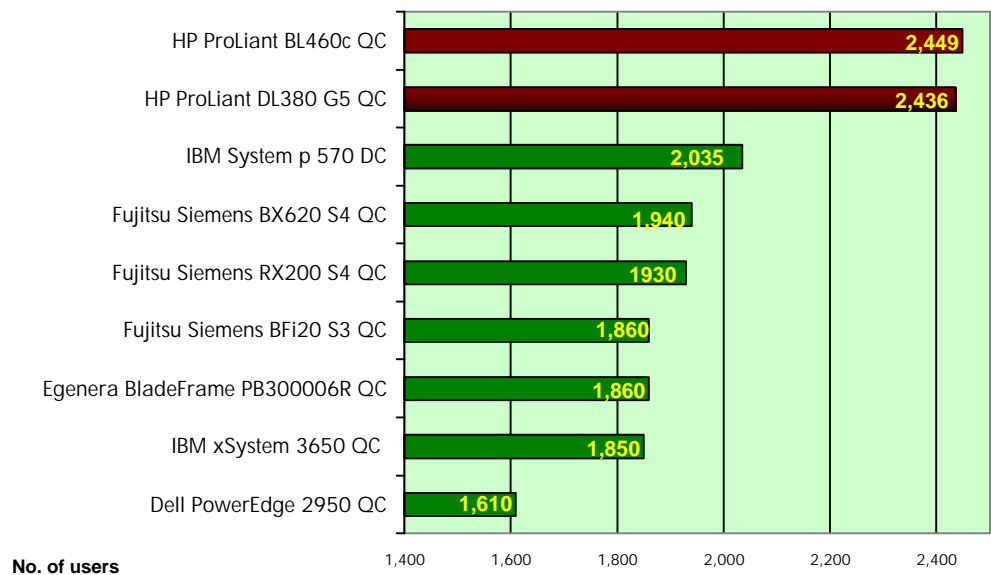


Figure 1. Comparison of performance results of the HP ProLiant BL460c and DL380 G5 two-processor Quad-Core servers vs. two-processor Quad-Core and Dual-Core competitors on the two-tier SAP SD Standard Application Benchmark. (All results as of 11-12-07. Details in Appendix A.)

ProLiant server configurations

The HP dynamic duo, the ProLiant BL460c server blade and ProLiant DL380 G5 rack server, maintained its leading streak of providing high performance by earning the #1 and #2 spots for two-processors on the two-tier SAP SD Standard Application Benchmark, respectively. The ProLiant BL460c took the #1 lead with 2,449 SAP SD Benchmark users, equivalent to a throughput of 245,000 fully processed order line items per hour and 12,250 SAPS. In addition, the world's highest volume server, the ProLiant DL380 G5's earned 2,436 SAP SD Benchmark users, equivalent to a throughput of 243,670 fully processed order line items per hour and 12,180 SAPS.

The benchmark tests were performed by HP's SAP Engineering lab in Houston, TX. HP received certification from SAP AG for the ProLiant BL460c (#2007065) and the ProLiant DL380 G5 (#2007064) on November 9, 2007. The servers were running Microsoft Windows Server 2003 Enterprise Edition x64, SP2 operating system, Microsoft SQL Server 2005 Enterprise Edition x64 SP1 database, and the SAP ERP 6.0 application. Both servers were configured with 2 x 3.16GHz Quad-Core Intel Xeon x5460 processors (2 processors/8 cores/8 threads), with 2 x 6MB L2 cache per 2 cores and 32GB main memory.

The ProLiant BL460c utilized an HP Smart Array E200i battery-backed write cache (BBWC) Smart Array Controller connected to 2 x 72GB, 15K SAS internal drives, a QLogic HBA, and an HP Modular Storage Array 1000 (MSA1000) with 14 x 72GB, 15K SCSI external drives. The ProLiant DL380 G5 used an HP Smart Array P400i Controller connected to 8 x 72GB 15K SAS internal drives, a Smart Array P600 Controller, and an HP MSA70 Controller with 25 x 72GB 15K SAS external drives.

Scalability increases with Quad-Core technology

Both the ProLiant BL460c server blade and the DL380 G5 show excellent two-processor scalability results with the new generation of quad-core processors on the two-tier SAP SD Standard Application Benchmark. The ProLiant BL460c showed a 17.7% increase in performance when it achieved 2,449 SAP SD Benchmark users (12,250 SAPS) for its current Quad-Core result from its previous result of 2,080 SAP SD Benchmark users (10,430 SAPS).

The ProLiant DL380 G5 also increased performance by an impressive 17.1% from its previous Quad-Core configuration result of 2,080 (10,430 SAPS) to its current 2,436 SAP SD Benchmark users (12,180 SAPS).

All results as of 11-12-07. Details in Appendix A.

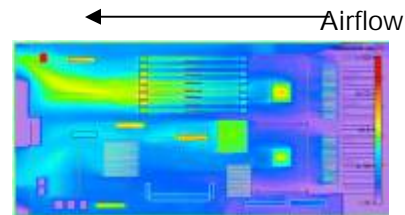
The HP ProLiant Advantage

HP SFF SAS: leading the future of storage



The transition to SFF SAS drives appears as one of the most significant transitions in the industry's history, fueled by the biggest required increase in storage capacity ever experienced along with the need for faster access to stored data.

- Higher reliability
 - 1.7 million mean time between failures (MTBF) vs. 1.5 million for 3.5" SCSI
- Better performance
 - Serial point-to-point connections
 - More spindles per platform
- Greater efficiency and improved thermals with SFF drives
 - Half the power consumption – 9 Watts
 - SFF enables better airflow



HP Smart Array Controller E200i

The HP Smart Array E200i is HP's first entry level PCI Express (PCI-E) Serial Attached SCSI (SAS) RAID controller. The full-size card has 8 ports and utilizes DDR1-266 memory. The E200 is ideal for RAID 0/1 and can be upgraded with the 128MB battery-backed write cache (BBWC) module for RAID 5.

HP Smart Array Controller P400

The HP Smart Array P400, used by the ProLiant DL380 G5 in this benchmark, is HP's first PCI-E SAS RAID controller and provides new levels of performance and reliability for HP servers, through its support of the latest SCSI technology and advanced RAID capabilities. The Smart Array P400 is ideal for SAS-based servers and storage enclosures that require mission-critical reliability and high performance.

HP Smart Array Controller P600



The HP Smart Array P600, used by the ProLiant BL460c server blade in this benchmark, a serial attached SCSI (SAS) controller, provides new levels of performance and reliability for HP servers, through its support of the latest SCSI technology and advanced RAID capabilities. The first of a new generation of SAS Smart Array controllers, the SA-

P600 offers twice the bandwidth of a 4-channel U320 array controller. The P600 offers a 512 MB BBWC option.

QLogic-based Fibre Channel Mezzanine HBA



The QLogic-based Fibre Channel Mezzanine HBA for HP BladeSystems uses the proven QLogic ISP2312 Fibre Channel ASIC. QLogic has successfully packaged a pair of 2Gb Fibre Channel HBAs into a single reliable ASIC including dual RISC processors, dual frame buffers and dual Fibre Channel interfaces with a single PCI interface.

HP Modular Storage Array 1000 (MSA1000)



The MSA1000 is the premiere storage system in the HP StorageWorks Modular Smart Array family, delivering industry-leading technology to meet today's demanding and growing storage needs. The performance and scalability of the MSA1000 allows for up to 18 additional ProLiant servers to be connected.

HP StorageWorks 70 Modular Smart Array



The HP StorageWorks 70 Modular Smart Array is an end-to-end flexible storage array, offering data availability, enhanced reliability, enhanced performance, and tiered storage capability with SAS and SATA drives and investment protection. Small and midrange business growing storage needs can be managed by deploying this low cost, flexible tiered storage system with up to 14.4TB capacity supporting SAS or SATA.

SAP and HP Partnership

HP has been partnering with SAP AG for over 20 years. Together, we've created a remarkable legacy providing world-class business solutions to global clients. Our offer is a unique combination of open, flexible technologies and broad expertise. That's why nearly half of the worldwide implementations of SAP applications run on HP infrastructure.

- HP servers host almost 50% of all SAP solution-based installations with more than 55,000+ installations and more than 20,000 customers.
- HP is the global disk storage market leader with 23.6% market share with a No.1 position in Storage Area Networks.
- HP is the leading provider of imaging and printing solutions for SAP applications.
- We integrate, certify, and optimize new solutions by utilizing:
 - Six SAP Solutions Centers located in Atlanta, Georgia and Houston, Texas, USA; and in Asia in Singapore, India, China, and Korea.
 - One SAP Competency Center, Walldorf, Germany.
 - 24x7 support through globally connected SAP support centers in more than 15 countries worldwide.
 - Four engineering labs located in Walldorf, Germany; Houston, Texas, USA; Nashua, New Hampshire, USA; and Redmond, Washington, USA.
- HP is one of the largest SAP customers in the world. HP uses SAP solutions for Enterprise Resource Planning and Supply Chain Management.
- HP's output management technology is a proven and recommended platform for output management in the context of SAP solutions.
- HP has been awarded SAP's highest level of partnership in 3 out of 4 key areas.¹

For more information

HP ProLiant BL460c: www.hp.com/servers/bl460c

HP ProLiant DL380 G5: www.hp.com/servers/proliantdl380

HP ProLiant storage solutions: www.hp.com/go/serial and <http://h18004.www1.hp.com/products/servers/platforms/storage.html>

SAP Benchmark details: <http://www.sap.com/benchmark>.

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November 2007

¹<http://h71028.www7.hp.com/enterprise/cache/13419-0-0-0-121.html>

Appendix A

Two-processor Quad-Core and Dual-Core competitor's configurations and results on the two-tier SAP SD Standard Application Benchmark

vs. [IBM System p 570](#). The IBM p5 570 (Certification #2007037) was configured as a two-processor server (2 processors/4 cores/8 threads) with Power6, 4.7GHz processors with 128KB L1 cache and 4MB L2 cache per core; 32MB L3 cache per processor and 32GB main memory. The IBM p570 was running SAP ERP 6.0 with AIX 5L Version 5.3 operating system and Oracle 10g database and achieved 2,035 SAP SD Benchmark users, equivalent to a throughput of 203,670 fully processed order line items per hour and 10,180 SAPS.

vs. [Fujitsu Siemens PRIMERGY Model BX620 S4](#). The Fujitsu Siemens BX620 S4 (Certification #2007049) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5365, 3.0GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The Fujitsu BX620 S4 was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,940 SAP SD Benchmark users, equivalent to a throughput of 194,000 fully processed order line items per hour and 9,700 SAPS.

vs. [Fujitsu Siemens PRIMERGY Model RX200 S4](#). The Fujitsu Siemens RX200 S4 (Certification #2007062) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5365, 3.0GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The Fujitsu RX200 S4 was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,930 SAP SD Benchmark users, equivalent to a throughput of 193,330 fully processed order line items per hour and 9,670 SAPS.

vs. [Fujitsu Siemens PRIMERGY Model Bfi20 S3](#). The Fujitsu Siemens BFi20 S3 (Certification #2007041) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5355, 2.66GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The Fujitsu Siemens PRIMERGY BFi20 S3 was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,860 SAP SD Benchmark users, equivalent to a throughput of 188,000 fully processed order line items per hour and 9,400 SAPS.

vs. [Egenera BladeFrame PB300006R](#). The Egenera BladeFrame PB300006R (Certification #2007041) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5355, 2.66GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The Egenera BladeFrame PB300006R was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,860 SAP SD Benchmark users, equivalent to a throughput of 188,000 fully processed order line items per hour and 9,400 SAPS.

vs. [IBM System X3650](#). The IBM X3650 (Certification #2007019) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5355, 2.66GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The IBM X3650 was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and IBM DB29 database and achieved 1,850 SAP SD Benchmark users, equivalent to a throughput of 185,330 fully processed order line items per hour and 9,270 SAPS.

vs. [Dell PowerEdge 2950](#). The Dell PowerEdge 2950 (Certification #2007008) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon Quad-Core X5355, 2.66GHz processors with 64KB L1 cache, 4MB L2 cache per 2 cores, and 32GB main memory. The PowerEdge 2950 was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,610 SAP SD Benchmark users, equivalent to a throughput of 163,670 fully processed order line items per hour and 8,180 SAPS.

Quad-Core scalability configurations and results on the two-tier SAP SD Standard Application Benchmark

[ProLiant BL460c September 2007 Quad-Core](#). The ProLiant BL460c server blade (Certification #2007054) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon X5355 Quad-Core 2.66GHz processors with 64KB L1 cache per core and 4MB L2 cache per 2 cores, and 32GB main memory. The ProLiant BL460c server blade was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 2,080 SAP SD Benchmark users, equivalent to a throughput of 208,670 fully processed order line items per hour and 10,430 SAPS.

[ProLiant BL460c January 2007 Quad-Core](#). The ProLiant BL460c server blade (Certification #2007002) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon X5355 Quad-Core 2.66GHz processors with 64KB L1 cache per core and 4MB L2 cache per 2 cores, and 32GB main memory. The ProLiant BL460c server blade was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 1,841 SAP SD Benchmark users, equivalent to a throughput of 184,670 fully processed order line items per hour and 9,230 SAPS.

Appendix A cont'd.

ProLiant [DL380 G5](#) [September 2007 Quad-Core](#). The ProLiant DL380 G5 (Certification #2007057) was configured as a two-processor server (2 processors/8 cores/8 threads) with Intel Xeon X5365 Quad-Core 3.0 GHz processors with 64KB L1 cache per core and 4MB L2 cache per 2 cores, and 32GB main memory. The ProLiant BL460c server blade (Certification #2007054) was running SAP ERP 6.0 with Microsoft Windows Server 2003 Enterprise Edition operating system and Microsoft SQL Server 2005 database and achieved 2,080 SAP SD Benchmark users, equivalent to a throughput of 208,670 fully processed order line items per hour and 10,430 SAPS.

Appendix B

Table 1. Comparison of performance results of the HP ProLiant BL460c and DL380 G5 Quad-Core, two-processor servers vs. IBM, Fujitsu Siemens, Egenera, Bull, and Dell Quad-Core, two-processor competitors on the two-tier SAP SD Standard Application Benchmark.

Processor	SAP SD Benchmark Users	Fully processed order line items/hour	SAPS	
ProLiant BL460c	2,449	245,000	12,250	
vs. Dual-Core system				The ProLiant BL460c has:
IBM System p 570	2,035	203,670	10,180	20.3% more no. of users than IBM p 570
vs. Blades Quad-Core systems				The ProLiant BL460c has:
Fujitsu Siemens BX620 S4	1,940	194,000	9,700	26.2% more no. of users than Fujitsu Siemens.
Fujitsu Siemens PRIMERGY Bfi20 S3	1,860	188,000	9,370	31.6% more no. of users than Fujitsu Siemens.
Egenera BladeFrame P300006R	1,860	188,000	9,370	31.6% more no. of users than Egenera BladeFrame
ProLiant DL380 G5	2,436	243,670	12,180	
vs. Density-optimized rack Quad-Core systems				The ProLiant DL380 G5 has:
Fujitsu Siemens PRIMERGY RX200 S4	1,930	193,330	9,670	26.2% more no. of users than Fujitsu.
IBM x3650	1,850	185,330	9,270	31.6% more no. of users than IBM x3650.
Dell PowerEdge 2950	1610	163,670	8,180	51.3% more no. of users than Dell PowerEdge.

All results as of 11-12-07